

US EPA ARCHIVE DOCUMENT

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Former Koppers Company, Inc., now know as Beazer East, Inc.
Facility Address: 1359 Logan Avenue, Youngstown, Ohio 44505
Facility EPA ID #: OHD 004 198 784

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

 X If yes - check here and continue with #2 below.

 If no - re-evaluate existing data, or

 if data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of AMigration of Contaminated Groundwater Under Control EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is **groundwater** known or reasonably suspected to be **contaminated**¹ above appropriately protective levels (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

- X If yes - continue after identifying key contaminants, citing appropriate levels, and referencing supporting documentation.
- _____ If no - skip to #8 and enter YE status code, after citing appropriate levels, and referencing supporting documentation to demonstrate that groundwater is not contaminated.
- _____ If unknown - skip to #8 and enter IN status code.

Rationale and Reference(s):

The Youngstown Plant was a raw coke-oven tar processing facility which produces electrode pitches, refractory pitches, bitumen, and other specialty refined tars from raw coke-oven tar. The facility was in operation from 1915 until 1987 and has been owned by Beazer East, Inc. (Beazer) (f/k/a Koppers Company, Inc.) since the 1920's. The site encompasses 17 acres and is located within the northern edge of the city limits of Youngstown, Mahoning County, Ohio. Most of the facility's buildings and manufacturing areas have been removed, except for support buildings for ongoing remedial activities. The site is well vegetated in areas not covered by asphalt or concrete pavement or pads.

Groundwater sampling of groundwater monitoring wells in December 2010 documented on- and off- site concentration of contaminants of concern (COC) above the Maximum Contaminant Levels (MCLs) and Ohio Water Quality standards as mixing zone averages (OMZA). The COCs are ethyl benzene 1,200 ppb MCL and 61 OMZA, xylene MCL 10,000 ppb and OMZA 27 ppb, and naphthalene MCL none and OMZA 21 ppb. The highest concentration of ethyl benzene in groundwater was 45 ppb. The highest concentration of xylene in groundwater was 46 ppb. The highest concentration of naphthalene in groundwater was 1,600 ppb. Dense non aqueous phase liquid (DNAPL) has been found in both on- and offsite monitoring wells ranging in thickness from non-detect to a maximum of 19.51 feet.

¹ Contamination and contaminated describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate levels (appropriate for the protection of the groundwater resource and its beneficial uses).

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within existing area of contaminated groundwater² as defined by the monitoring locations designated at the time of this determination)?

 X If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the existing area of groundwater contamination²).

 If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the existing area of groundwater contamination²) - skip to #8 and enter NO status code, after providing an explanation.

 If unknown - skip to #8 and enter IN status code.

Rationale and Reference(s):

Based on semi-annual groundwater monitoring data collected over the period 2004-2010 the contamination plume is stabile. Local and site geology information indicate a sandy alluvium layer approximately 15 to 20 feet thick along the western Crab Creek Valley and is between 50 to 60 feet thick in the valley floor. Discontinuous layers of hard clayey lodgement till underlying discontinuous layers of dense sandy ablation till up to approximately 10 feet were encountered along the western Crab Creek Valley wall. Bedrock core data indicate a southward dipping sandstone layer within the Sharpsville Sandstone. Ground water flow is toward the valley center and southward. The plume dimensions are approximately 4,700 feet by 1,600 feet by 90 feet. There are active and passive recoveries of DNAPL and active pumping of contaminated groundwater.

² existing area of contaminated groundwater is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of contamination that can and will be sampled/tested in the future to physically verify that all contaminated groundwater remains within this area, and that the further migration of contaminated groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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4. Does contaminated groundwater **discharge** into **surface water** bodies?

 X If yes - continue after identifying potentially affected surface water bodies.

 If no - skip to #7 (and enter a YE status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater contamination does not enter surface water bodies.

 If unknown - skip to #8 and enter IN status code.

Rationale and Reference(s):

Contaminated groundwater discharges from the site into an adjacent perennial stream named Crab Creek. Crab Creek is approximately 50 feet from the east site boundary. Crab Creek is a tributary to Mahoning River and lies in the Ohio River Drainage Basin. Crab Creek has been assigned the following designated uses by Ohio Environmental Protection Agency.

- Warm water habitat (WWH)
- Agricultural water supply (AWS)
- Industrial water supply (IWS)
- Primary contact recreation (PCR)

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5. Is the **discharge** of contaminated groundwater into surface water likely to be **insignificant** (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater level, and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter YE status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater level, the value of the appropriate level(s), and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

 X If no - (the discharge of contaminated groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater level, the value of the appropriate level(s), and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater levels, the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter IN status code in #8.

Rationale and Reference(s):

Naphthalene concentrations (1,600 ppb) are not within 10 times the OEPA media standard of 21 ppb. Therefore, naphthalene is termed a no for this question and is carried forward to the next question. Ethylbenzene concentrations (45 ppb) are within 10 times the OEPA media standard of OMZA 61 ppb. Therefore, ethylbenzene is termed a yes for this question and is not carried forward to the next question. Xylene concentrations (46 ppb) are within 10 times the OEPA media standard of OMZA 27 ppb. Therefore, xylene is termed yes for this question and is not carried forward to the next question.

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the **discharge** of contaminated groundwater into surface water be shown to be **currently acceptable** (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

X

If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the sites surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,⁵ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment levels, as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

— If no - (the discharge of contaminated groundwater cannot be shown to be **currently acceptable**) - skip to #8 and enter NO status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

— If unknown - skip to 8 and enter IN status code.

Rationale and Reference(s) Naphthalene concentrations measured in monitoring wells considered ground-water/surface-water wells (wells located and screened adjacent to Crab Creek) exceeded 10 times the OEPA surface water quality standard of 21ppb. The on-site groundwater values at MW-57A was 1,600 ppb (December 23, 2009 sampling) exceeding the ten times the OEPA media standard of OMZA 21 ppb. A mixing zone calculation was therefore applied; data used for the calculation include maximum benzene concentrations measured in GSI wells, hydraulic conductivities, surface water flow rates in Crab Creek and groundwater gradients. Results indicate naphthalene concentrations in surface-water will be 4.1 ppb, respectively. Therefore the discharge to groundwater is deemed "acceptable".

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the existing area of contaminated groundwater?
- ☒ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the existing area of groundwater contamination.
- ☐ If no - enter NO status code in #8.
- ☐ If unknown - enter IN status code in #8.

Rationale and Reference(s):

Monitoring is currently conducted per the U.S. EPA-approved monitoring plan.

Groundwater will be routinely monitored as part of the groundwater monitoring program to assess the effectiveness of the implemented remedial measure and to verify that the site groundwater contamination has not migrated beyond its currently delineated extent. Monitoring will include the collection of water levels for groundwater flow gradient determinations and periodic analytical sampling to assess groundwater quality conditions. Surface water and sediment samples will be periodically collected to assess surface water and sediment quality conditions.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

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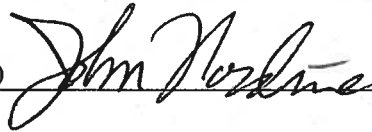
X YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the former Koppers Company, Inc. now known as the Beazer East facility, EPA ID # OHD 004 198 784, located 1359 Logan Avenue, Youngstown, Ohio 44505. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

____ IN - More information is needed to make a determination.

Completed by

(signature)



Date

7-21-2011

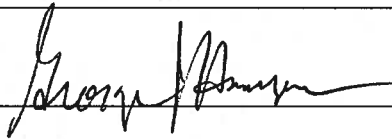
John

Nordine

Geologist

Supervisor

(signature)



Date

7-29-11

George

Hamper

Chief

EPA Region 5

Locations where References may be found:

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